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## CERTIFICATE

This certificate is issued in support of an application for Patent registration in a country outside New Zealand pursuant to the Patents Act 1953 and the Regulations thereunder.

I hereby certify that annexed is a true copy of the Provisional Specification as filed on 7 July 1999 with an application for Letters Patent number 336603 made by DANNY MORRIS.

Dated 4 July 2000.

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336003

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**PROVISIONAL SPECIFICATION**

**Title:** Furniture

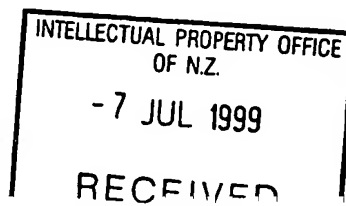
I, *Danny Morris*,

Nationality: *A citizen of the United Kingdom*

Address: *Free Spirit, 9C Melandra Road, Stanmore Bay, Hibiscus Coast, New Zealand,*

do hereby declare this invention to be described in the following statement :

- 1 -



## TECHNICAL FIELD

This invention relates to adjustable furniture. For convenience only, the present invention will be described with reference to furniture such as beds for which the invention may be particularly applicable. However, it is to be understood that it is not to be limited as such.

- 5 Moreover, because the invention may have other applications it is to be understood that the background art and possible embodiments of the invention as discussed below are given by way of example only.

## BACKGROUND ART

- 10 Traditionally beds have been made to only a few specific sizes depending on requirements. For example, a cot for babies, a single bed for one person, or a double bed for two people, the double bed being either a large "king" size or a slightly smaller "queen" size.

- Due to these set sizes, people are left with little choice of alternative sizes to suit their individual requirements. For example, it may be necessary to buy an adult size bed for a  
15 child's room where this size may not be required until several years later. Hence space in the room which may have more appropriate uses when the child is young, is unnecessarily taken up by the bed. Moreover, in designing a bedroom the architect may be constrained by the fixed size of the bed so that it is difficult to optimise the design.

- Furthermore, in the case where a cot is provided for a child, this may only be suitable for a  
20 short period of childhood, after which a larger bed must be bought. Not only does this involve extra costs but also a child may be reluctant to part with their bed. Folding beds and modular type beds (ie. beds where a base may be slid under the bed) do address some aspects of the problem with fixed sized beds in that a double size bed can be folded or stowed away so as to only take up the space of a single size bed. However, the bed size is still limited to a  
25 standard length and width so that the size of the bed cannot always be optimised.

Similar problems with obtaining optimum sizing of furniture to suit a room or to suit changing requirements may also arise with various other types of furniture such as couches, bookcases and the like. These too, as with beds, are of fixed dimensions once assembled

thus putting a constraint on the design of a room, and may with time become too large or too small for requirements. Moreover, they may be no longer required for their initial function, and simply take up space.

Another problem with fixed sized furniture arises when installing the furniture in the room.

- 5 Since the size is fixed it may be difficult or impossible to carry the furniture in its assembled form into the room due for example to narrow doorways, or staircases, thus making it difficult to install or rearrange such furniture.

## **OBJECT**

- 10 It is therefore an object of the present invention to provide various types of furniture which address the above problems or at least provide the public with a useful choice. It is another object of the present invention to provide furniture constructed so that the size thereof can be easily varied, to give a wide range of sizes to suit varying requirements.

## **15 DISCLOSURE OF THE INVENTION**

According to one aspect of the present invention there is provided a furniture item comprising; at least a pair of members defining a dimension in one direction of said item, the members of said pair being connected together by adjustable connecting means, the arrangement and construction being such that said dimension in one direction can be adjusted  
20 by means of said adjustable connecting means.

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According to another aspect of the present invention there is provided a furniture item substantially as described above further comprising at least a second pair of members defining a dimension in a second direction substantially perpendicular to said one direction, the members of said second pair being connected together by a second adjustable connecting  
25 means, the arrangement and construction being such that said dimension in said second direction can be adjusted by means of said second adjustable connecting means.

The invention may be applicable to a variety of furniture items where it is desirable to be able to change the dimensions. For example, the furniture item may be a book case and the dimension in one direction may be a width or a height of the book case. Alternatively the furniture item may be a bed, with the dimension being a length or width of the bed.

- 5 The adjustable connecting means may involve any device or devices whereby the members may be optionally located in a plurality of positions relative to each other. For example this may involve linkage means connected between members of the pair, the arrangement and construction being such that the members may be located relative to each other in a plurality of configurations.
- 10 A suitable linkage arrangement may involve linkages such as found with folding beds. In this case linkages may be arranged such that the width of the furniture item may be set to a range of widths, rather than the two widths provided by a conventional folding bed.

- Alternatively or in addition the adjustable connecting means may involve a sliding element fixedly connected relative to one of the members, and slidably engaged with an element
- 15 fixedly connected relative to another of the members, the arrangement and construction being such that when the elements are slid relative to each other the members are constrained to move relative to each other along a substantially straight line.

- In the case of such a sliding element fixedly connected relative to one of the members, this may be of any suitable section which may be engaged with a complementary surface formed
- 20 on the other member. For example this may involve an angle or channel, which engages with a pin or pins on the other member, or a cylindrically shaped member which slides inside an aperture or tube formed on the other member.

- The adjustable connecting means may also involve locking means for locking the elements or members relative to each other at a plurality of configurations. For example this may involve
- 25 clamping means which depend on frictional forces between adjacent surfaces, or fastening devices which positively locate the elements or members relative to each other, or a combination of both.

The members may thus be fastened together at different relative locations to each other, enabling variation in the dimension or dimensions of the furniture item. The connecting means may also make use of other items in a room to provide location of the members relative to each other. For example, locational forces may be provided by frictional forces  
5 between item and the floor.

Various types of fastening and clamping devices are possible. For example these may involve the use of pins or bolts which fit into apertures provided at a plurality of locations on the elements. A possible arrangement may be similar to that used for telescopic tripods or tent poles where a pin provided inside one tubular member is resiliently biased so as to  
10 spring out and engage in an aperture in the telescoping member. The fastening and clamping device may also involve threaded members which may be tightened to clamp contacting surfaces of the elements together.

Friction members may also be provided to improve the locking effect. For example in the case of tubular members "O" rings may be used. In this case one possible arrangement may  
15 involve an "O" ring which is slidable along a tubular member which fits inside a larger diameter pipe having a flared inlet for accommodating the "O" ring, the arrangement being such that movement in one direction forces the "O" ring tight against the outer surface of the tubular member and the flared surface of the pipe thus preventing relative movement in that direction. Alternatively a Crox nut type pipe coupling may be used with an "O" ring nipple,  
20 the "O" ring being clamped against the sliding surface with tightening of the coupling.

Members and elements of the furniture item may be made from a variety of materials as required or desired. ~~In this respect the design and function of the adjustable connecting~~  
means may be chosen to suit the type of materials used. For example, in the case of a bed using metal or plastic tube for the frame, the connecting means may involve telescoping  
25 portions of the metal or plastic tube with metal or plastic tube type couplings. With a metal bed having for example angle or channel section structural members the connecting means may involve elongate slots formed in sections of the members, with threaded pins fixed to the mating members, and fitted with wing nuts which may be tightened to clamp the members together at optional relative positions. In the case of a bed with wooden slats for  
30 the mattress support, the adjustable connecting means may involve flexible bands such as



"O" rings which resiliently hold portions of the slats together while allowing limited relative movement therebetween in a lengthwise direction of the slats.

5 In the case of a wooden book case, the connecting means may involve elongate slots formed in sections on one structural member of the book case and threaded pins fixed to the mating portions on another structural member of the book case, and fitted with wing nuts which may be tightened to clamp the members together at optional relative positions.

10 In the case of an adjustable bed, a mattress for the bed may be constructed so that the size thereof can be changed to suit the adjusted size of the bed. Suitable materials for the mattress may involve foam, air, water and more traditional materials. The mattress design may involve a modular construction so that sections may be added or removed as required. In this case a mattress cover may be provided which can accommodate the largest anticipated size, and portions of the cover can be folded under the mattress when the mattress size is reduced.

15 Sections of the mattress may be connected by any suitable means. For example in the case of a foam type mattress this may involve interlocking sections formed on the edges of the mattress sections. A suitable type of interlocking may involve for example, protruding and recess portions such as found on bubble packaging or sound proofing foam. An adjustable thick cover (eg. padded calico or thick cotton) may also be used to cover any additional sections, preventing slippage and any unevenness, thus giving the overall appearance and feel  
20 of a traditional mattress.

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In the case of water mattresses, a standard sectional water mattress can be utilised with additional compartments being filled, as and when required. Similarly with air mattresses the size can be adjusted by inflating additional compartments.

25 As well as addressing the above problems encountered with fixed dimension type furniture, the present invention may also open up other aspects related to the uses of furniture which have not heretofore been considered. For example, a bed of variable dimensions may be made in the form of a house which could be extended to make a mansion, a bed representing a fort could be transformed into a castle, a bed in the form of a mini car could be transformed into one in the form of a stretch limousine. Additional accessories may also be added

accordingly; for example book cases, writing desks etc. A bed in the form of a fort could have a drawbridge which becomes a desk.

## BRIEF DESCRIPTION OF THE DRAWINGS

- 5 Further aspects and advantages of the present invention will become apparent from the ensuing description which is given by way of example only and with reference to the accompanying drawings in which:

Figure 1: is a schematic plan diagram of an adjustable bed according to an embodiment of the present invention showing a plan view;

- 10 Figure 2: is a side view of the bed of Fig. 1;

Figures 3 and 3a: are enlarged views of a typical connecting device;

Figure 4: is a head end view of the bed of Fig. 1; and

Figure 5: is a foot end view of the bed of Fig. 1.

## 15 PREFERRED EMBODIMENT

With reference to the figures, there is shown a furniture item according to the present invention in the form of a bed generally indicated by arrow 1. The bed 1 comprises a first pair of members defining a lengthwise direction, in the form of a bed head 2 and a bed foot 3.

- 20 The bed head 2 and bed foot 3 are connected together by adjustable connecting devices generally indicated by arrow 4 provided on either side of the bed 1. As shown in detail in Fig. 3a, each of the connecting devices 4 comprise a portion of an outer tube 5 connected to the bed head 2 and a portion of an inner tube 6 connected to the bed foot 3. The diameters of the portions of the tubes 5, 6 are such that the tube 6 can slide freely inside tube 5 while being constrained thereby so as to move along its longitudinal axes.

- 25 The connecting devices 4 also comprise a locking coupling in the form of a Crox coupling generally indicated by arrow 7 having a nut portion 8 which is threaded onto a threaded

portion 9 formed on the end of the tube 5, with an "O" ring 10 fitted inside the nut portion 8. The "O" 10 ring fits snugly around the tube 6 and is clamped tightly against the tube 6 when the nut 10 is tightened onto the thread 5, thereby locking the tube 6 relative to the tube 5.

5 With this arrangement the distance between the bed ends 2 and 3 may be adjusted to a required length, by sliding the pipe 6 inside the pipe 5. The bed ends 2, and 3 can then be locked in position relative to each other by tightening the coupling 7.

10 The bed is also provided with a number of cross members 11 and 12 to provide support for the mattress of the bed. The cross members 11 are fixedly connected at predetermined spacing to the pipe 5, while some or all of the cross members 12 may be slidably fitted to the pipe 6. This enables the spacing of the cross members 12 to be adjusted to suit the length of the bed 1.

15 To ensure a desired spacing of the cross members 12 with different degrees of extension of the bed 1, a suitable location device may be used. For example this may involve protrusions on the pipe 6 which locate the ends of the cross members 12 at the required spacing. Alternatively a flexible member may be tied between the cross members 12 so that as the bed 1 is increased in length, the cross members 12 are separated from each other, while as the bed 1 is decreased in length the cross members 12 are able to lie closer to each other.

20 Although not shown in the drawings, additional leg supports may be provided if required at intermediate portions along the pipe member 5. These may be pivotally attached to the pipe member 5 and folded down to give additional support when the bed is in an extended condition.

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25 With the present embodiment the width of the bed 1 is also adjustable in a similar manner. As shown in Fig. 4 and Fig. 5, the bed head 2 and bed head 3 are each made up as two sections which are connected together by a second pair of adjustable connecting devices generally indicated by arrow 13 and 14. These connecting devices 13 and 14 are similar in design and function to the connecting devices 7 except that the dimensions of the telescoping pipe sections may be different depending on the design and strength requirements. Moreover, the cross members 11 and 12 are formed with telescoping tubular sections 15 which can telescope inside each other as the width of the bed 1 is changed.

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With such an arrangement the width of the bed as well as the length can be adjusted to suit requirements.

For example the bed can be made smaller for transport or installation, and then expanded to a desired size once installed.

- 5 The bed can also be extended or widened to suit the size of a child as they grow, or can be easily adjusted at any time as may be required by children when playing. Moreover, the size of the bed can be easily increased or decreased as required to suit individual requirements.

Various types of mattress design may be used with the bed. For example a foam mattress of modular construction may be used, and sections may be added or removed as required. The  
10 mattress for the bed may be made of a modular construction so that separate modules may be connected or removed as required to suit the different sizes of the bed.

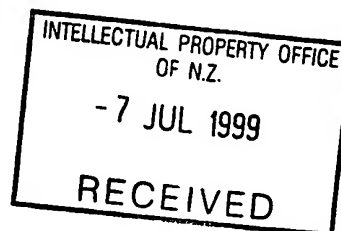
We believe the advantages of our invention to be as follows, however it should be appreciated that all such advantages may not be realised on all embodiments of the invention, and the following list is therefore given by way of example only as being indicative of  
15 potential advantages of the present invention. Furthermore, it is not intended that the advantages of the present invention be restricted to those of the list which follows.

1. The sizes of furniture items can be easily adjusted to suit requirements, thus extending the range of application of a particular type of item.

2. In the case of a bed, this can be easily changed in size to suit requirements.

20 Aspects of the present invention have been described by way of example only and it should be appreciated that modifications and additions may be made thereto without departing from the spirit or scope thereof.

25 PIPERS  
Attorneys for  
Danny Morris



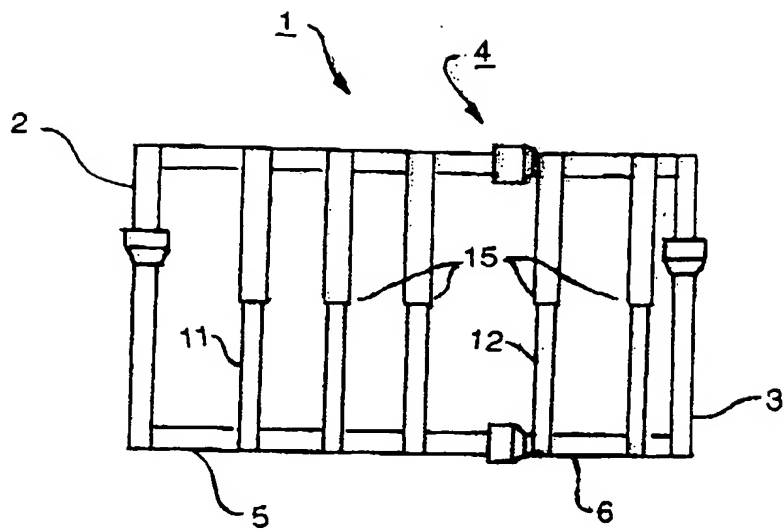


FIG. 1

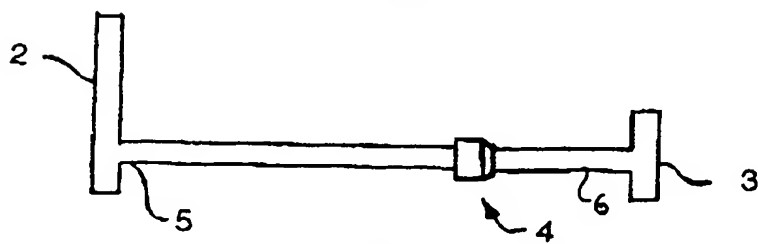


FIG. 2

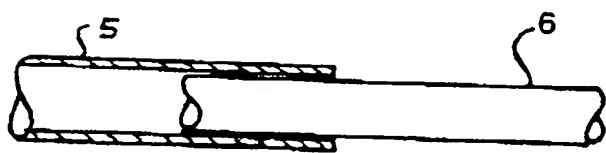


FIG. 3

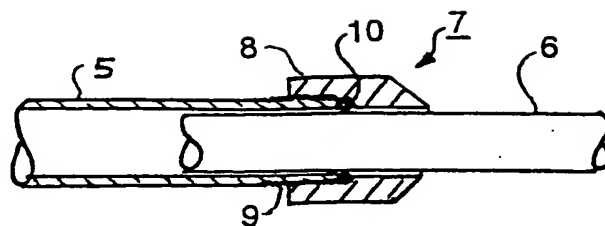


FIG. 3a

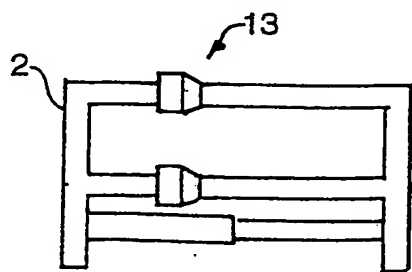


FIG. 4

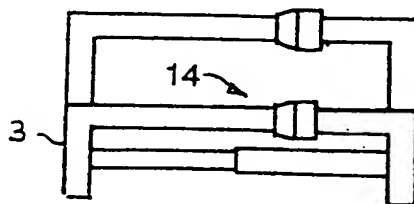


FIG. 5

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